ADMINISTRATION REPORT OF CIVIL WORKS

OF THE

PUBLIC WORKS DEPARTMENT,

(GENERAL BRANCH),

BOMBAY PRESIDENCY,

FOR THE YEAR

1888-89.

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GENERAL REMARKS.

I. Early in 1887 Government took into consideration the subject of the revision of the Public Works establishments, with a view to economy in expenditure and increased efficiency of administration. Proposals of an important character were formulated, and formed the subject of protracted correspondence with the Government of India. During 1887-88 certain of the changes were carried out, and in the year under report the proposals as a whole, having been sanctioned by the Government of India and the Secretary of State, were carried fully into effect. The subject was dealt with succinctly in an address delivered by His Excellency the Governor, before the Chamber of Commerce on Thursday, 11th April 1889, from which the following is an extract:—

I come next to a department—that of the Public Works—about which you say that its reorganization would alone afford material for an extensive inquiry by qualified experts. You consider that the charges for superintendence of work seem out of all proportion to the actual value of work done, and that under this head a revision with a view to economy is desirable. On that point I can heartily agree with what you say, because your remarks on the subject were followed up by the action which I took, and on which, I am afraid, I shall have to enter into rather minute details. The subject, as you say, is intricate. The Finance Committee really left it alone, and the Government of Bombay, I believe, is the first Government which has taken in hand the question of the superintendence of the Public Works Department. A very able Indian administrator wrote to me quite recently that he himself had found the Public Works a subject on which it was hopeless to have a policy: this shows how extremely difficult the subject is. Our policy was to execute out of the funds at our disposal a maximum of works with a minimum of establishment. In 1862, a little over 26 years ago, the Government of the late Sir Bartle Frere inaugurated a separate Irrigation Department for the Deccan under the presidency of a distinguished officer—Captain (now General) Fife, R. E. Sir Bartle Frere, as well as General Fife, had a large experience of Sind, a country in which the cultivation almost entirely depends on irrigation, and in which water has only to be made available to (within the limits of the capacity of the population) be immediately made use of with avidity. At the time the formation of a separate Irrigation Department was ordered, all the eastern districts of the Deccan and Khándesh were threatened with famine from drought, and the view which presented itself to Government was that, while this was the case, every stream rising in the Western Ghâts had for two months been pouring down such volumes of water, as would have sufficed, if raised to the level of the Eastern plains, to ensure luxuriant crops; the Government further enunciated the view that works which would ensure water during the monsoon months only, would secure very valuable crops in every part of the Deccan, and also that such works could be constructed at a very moderate outlay, on almost every river which is fed from the Western Ghâts. The department so formed grew and extended, as all departments constantly tend to do. In 1887, it consisted of a Chief Engineer and an Assistant, with an establishment of eight separate Executive charges, costing Rs. 3,95,017 per annum, the expenditure for the year being Rs. 6,50,000, and the direct revenue administered by the department being Rs. 3,38,057. Of the expenditure Rs. 4,40,000 was capital outlay on works, then drawing to completion. In the meantime the anticipations as regards the utility of works affording a supply during the monsoon months had been fully tested, with the result that such works were of use in ordinary years, only to a very limited extent, the people being very averse to the extended use of the means of artificial irrigation for the ordinary crops grown at that season. This result is accounted for partly by the expense of manuring and preparing the fields for irrigation, and by the character and distribution of the rainfall, which, in ordinary seasons in most districts, renders artificial irrigation unnecessary, and, the people think, even injurious as respects the staple crop—jowâri. In fact, the experience of the past 25 years may be said to be that a permanent supply of water, affording the means of irrigation all the year round, so as to admit of the more valuable rábi and perennial crops, such as wheat, gram, ground-nut, sugarcane, and garden crops of all kinds, is essential to the success of the works. If the supply is not of this class, the works will not pay even their working expenses, and in ordinary seasons the supply, during the short period it is available, will in most cases run to waste, unutilized. In the earlier years of the existence of the department, money was plentiful, but as years went on, the Government were led more and more to insist on the necessity of regarding

expenditure of this class as an investment on commercial principles, and to insist on proof being forthcoming beforehand, of the financial soundness of any scheme proposed for execution. Even the best of the works in the Deccan has as yet failed to show a return on the outlay of more than 2¼ per cent., and it is not to be wondered at that, with this experience, the Government, with all its financial difficulties, should refuse to embark in further undertakings of the class. The department has, however, left some great monuments of its existence—the Mutha Canals in Poona, fed from Lake Fife, so named after its distinguished originator; the Nira Canal in the same district, which also originated with General Fife, but has been from its commencement under the guidance of one of our most distinguised engineers, Mr. Whiting; and the Mhaswad Tank, situated in Sátára, but which irrigates lands chiefly in Sholápur, with the original conception of which work General Fife was also concerned. There are, in addition, many other works in various parts, of a similar class, though smaller. To the officers of the department, too, some tribute is due. They have worked zealously and with devotion, and have accumulated stores of experience which will be of value to succeeding Governments for years to come. It is further to be observed that the works themselves, though many of them anything but a financial success, are of great importance in seasons of drought, when the area of irrigation expands. The direct and indirect return may in such years be said to cover a large proportion of the loss in other years, when irrigation is not resorted to, though the same, or nearly the same expenditure has to be incurred in keeping the works in order. Thus, in the past year, one of deficient rainfall, the works together, irrigated 70,366 acres,* as compared with 46,187 in 1887-88, and 42,628 in 1886-87, both years of good rainfall. These areas are small, as compared with those irrigated by canals in Northern India; but there is a great difference in the configuration of the country and the sources of supply, and in the Deccan, with its steep confined valleys and rocky ground, with no large rivers affording a permanent supply of water, it is no small matter to have secured over 110 square miles of irrigated cultivation in a year in which cultivation would, in the particular tracts concerned, have been impossible without the means of artificial irrigation. It has been suggested that some of the works, giving the worst financial results, should be abandoned; but as these are often of greatest assistance in years of drought, it is considered this would be a mistake, as the benefit they confer directly on the rayat and indirectly on the Government in increasing the food and fodder supply, is of almost incalculable local advantage. Experience goes to show that the future policy should be, when funds are available, to provide storage works to supplement the supply to those canals which now only afford water for irrigation during the monsoon, and are only utilized to any considerable extent in seasons of drought. This will convert a machine ordinarily practically useless, into one at all times affording means of a higher class of cultivation in considerable areas, and at the same time retain their efficiency as a means of mitigating the local effects of drought, by extending cultivation to those crops requiring water during the monsoon and early rábi season only, and which could not otherwise be raised.

The state of the case in 1887, then, was a large and expensive department with very little work to show, and with no prospect of there being any, until the financial results of past operations showed more promise. The existence of the department itself militated against such a result, as the cost of its establishments had to be borne to a large extent by the capital and revenue accounts of the schemes in operation, which, of course, swallowed up any profits there might otherwise be. This is the problem as it presented itself to this Government, whose anxious consideration it engaged for some time, with the result that it was decided to amalgamate the duties of the Irrigation and ordinary Public Works duties in certain of the districts in which hitherto two separate officers had been employed, and to place the duties of general supervision and control in all cases under the Superintending Engineers of the several Divisions, and thus dispense with the separate office of Chief Engineer for Irrigation. In four of the Irrigation charges, with an establishment costing (exclusive of any share of the Chief Engineer's establishment) Rs. 1,40,168 per annum, the outlay to be supervised was only Rs. 1,47,982, and the revenue only Rs. 98,617, and in such circumstances there was no justification whatever for the maintenance of separate appointments for duties which could be efficiently performed by the ordinary Public Works agency, at largely reduced cost. In so amalgamating charges, the intention is to carefully preserve the experience gained by the separate Irrigation Department, by arranging for the posting of the officers themselves to suit the duties required of them, and, it is believed, the change has been accomplished without material sacrifice of efficiency in either branch of the service. At or about the same time other reductions were effected by investigation of the scale of all classes of establishments. Commencing with the higher or administrative appointments, this Government, in the first instance, sought to increase efficiency, and at the same time reduce expenditure, by a separation of the purely administrative or Secretariat work from the more strictly technical or professional duties. In the Executive and Assistant grades, the only changes effected have been the amalgamation of duties in certain of the districts already referred to, whereby in place of two Executive officers, one of whom was solely employed at ruinous cost, in the supervision of works of irrigation, giving very unsatisfactory financial results, the duties are combined and consolidated under one officer and one establishment. This combination was, it may be explained, effected in anticipation of large reductions in the grants available for expenditure on ordinary Public Works, and with the knowledge that there was no prospect of funds being made available for the construction of new irrigation works in the Deccan and Gujarát, pending a more favourable financial result from those already completed. Financially, the result of the proposals as they affect the Engineering establishment (including the higher appointments) is a saving of Rs. 6,750 per mensem in salaries alone, or, including allowances, probably not less than Rs. 90,000 per annum. The whole of this saving will not be effected immediately, as pending vacancies reductions are not feasible; but at the present time a saving to the extent of Rs. 3,700 per mensem has been effected, or, including allowances, say Rs, 48,000 per annum. The Upper Subordinate Establishment came next under scrutiny, and it was found that the numbers on this establishment might

* *Note.*—This was according to estimate. The actual area proves to have been 77,318 acres as compared with 44,303 acres in 1887-88, and with 40,903 acres in 1886-87. The figures for the latter years given by His Excellency include old patasthal lands on certain of the works.

safely, in anticipation of reduced grants and in furtherance of the policy of exacting full responsibilities from a highly-paid agency, be reduced from 220 to 210. This has been done by absorbing vacancies as they occurred, and the saving in salaries alone has thereby been Rs. 18,600, or, including allowances, about Rs. 22,500 per annum. In Accountants the saving effected by the abolition of four separate irrigation charges is estimated at Rs. 10,115 per annum. The reduction in the number of offices further led to a reduction in the permanent clerical staff, the net result of which was a saving of Rs. 28,128 per annum. This has now been wholly realized by retirements and absorption of supernumeraries. Next, the scale of Temporary Establishments came under review, and under this head a large saving was effected, principally by the abolition of cashiers, whose duties now fall to the subordinates in charge of sub-divisions. This was the subject of minute enquiry, and the result is as follows :—

	Rs.	a.	p.
Temporary Establishment of all classes sanctioned for half-year ending 31st March 1887	13,587	5	0
Temporary Establishment of all classes sanctioned for half-year ending 30th June 1888	9,511	5	0
Saving per month in salaries only ...	4,076	0	0

or, including allowances, say Rs. 55,000 per annum. This has been effected at some cost to the individuals affected, but not unjustly so, as their employment in each case was temporary only, and their tenure in every case was regulated by the necessities of the Service. Finally, proposals have been made and are now before the Government of India, for a revision of the system of auditing expenditure, which, if sanctioned, will effect a large economy in Accounts Establishment. The former system under which the Executive Engineers all over the country had to send their accounts for audit to the Examiner's Office in Bombay, possessed serious defects. The accounts were *compiled for purposes of audit*—a manifestly wrong principle, and one which led to over-centralisation to such a degree as to make the system unworkable, and defeat the intention, which was to spare the Executive Engineers drudgery, and prevent cooking of the accounts. Moreover, the audit was, to a large extent, simply a check or comparison of compiled accounts, and a very large proportion of the outlay was, in fact, unvouched for, as the initial vouchers for departmental payments were not submitted to scrutiny. The scheme now proposed, and which has been experimentally in force in one Division (nine districts) for now over a year, with marked success, is an adaptation of the principle of the system in force under the Railway Companies. Under it, the accounts are to be completely audited in the Executive Engineers' Offices, by a staff of travelling auditors, supervised and controlled by *Gazetted* Officers of the Accounts Department, who will themselves audit the accounts of each office periodically. By this means a thorough and efficient audit of initial vouchers will be secured : the labour of compiling accounts for all but booking purposes, will be entirely saved, and very material relief will be afforded to the Executive Engineers, who will thereby have more time to devote to the inspection of works and strictly professional duties. By this means and by the modification of work in the central office, it is estimated that a saving of Rs. 49,284 per annum will be effected. This includes the pay of a Deputy Examiner, now on leave, who will have to be provided for elsewhere by the Government of India, to whose establishment he belongs. The whole of the balance will be saved almost immediately, with the exception of one item of Rs. 5,820, the full benefit of which can only be obtained on the retirement of certain of the more highly-paid Accountants. It may be mentioned that the extension of the railway lines in this Presidency has facilitated this alteration of system, the absence of the means of rapid communication in former years, itself rendered the former central audit system perhaps the only feasible one, in spite of its serious defects. To sum up, the following is a recapitulation of the economies under all heads : —

	Already (or about to be) effected. Rs.	Including Prospective Savings. Rs.
Engineering Establishment ...	48,000	90,000
Upper Subordinate Establishment ...	22,500	22,500
District Accountants	10,116	10,116
Office Establishment	28,128	28,128
Temporary Establishment	55,000	55,000
Account Establishment	43,464	49,284
	2,07,208	2,55,028

Including saving in liability for leave and pension allowances, calculated at the established rate of 14 per cent. on the savings in salaries of permanent posts only (excluding that of the Deputy Examiner re-transferred to Government of India), the total saving to the State will be—

	Rs.	
Immediate	2,24,208	per annum.
Prospective	2,76,749	

Quite lately, we had a Commission of the Government of India to look into the subject of Public Works accounts ; and although the members of that Committee were at first not disposed to take a sanguine view of this reform, still when they left, we obtained from them the assurance that, although it was not the plan which they intended to recommend to us, still they thought that our scheme should have a further trial, and they were prepared to allow us to extend it to the whole Presidency. These reforms have been carried out after an amount of labour which you would hardly imagine, and they could only have been carried out by means of a perfectly harmonious co-operation of the Accounts Department of the Public Works and the Public Works Secretariat. While on this subject, I must give the highest praise both to Major LeBreton and Mr. Hughes, who have worked out all the harassing details without sparing themselves. The

result of these reforms, as you have already seen, is an immediate saving of Rs. 2,24,000 per annum, and a prospective saving of Rs. 2,76,000.

* * * * * * * * * * *

It will be observed that the change as respects the system of audit of accounts was at that time still under consideration. It has since been sanctioned, but the subject and economies effected thereby do not pertain to the year now under report.

2. The actual cost of the establishments of all classes during 1888-89 was Rs. 18,79,949 as compared with Rs. 20,91,638 in 1886-87, and Rs. 19,39,361 in 1887-88. In the latter year the changes above referred to in the organisation of the Engineering establishments had, as already stated, been partially effected, and to arrive at the total saving, comparison must be made with the year 1886-87. This shows a total reduction of Rs. 2,11,689 as compared with Rs. 2,07,208, the estimate given in the foregoing extract from the address by His Excellency the Governor. The indication is that if the change in the system of audit proves as economical as is anticipated, the actual prospective saving will exceed the estimates.

3. The total outlay on works and repairs under all heads, including Irrigation, during the year amounted to Rs. 68,11,619, and the establishment charge thus amounted to 27·6 per cent. on the outlay. Omitting the Barrack Department outlay, which necessarily comprises a large share of establishment in proportion to expenditure on supplies, and also omitting Irrigation Establishment and outlay, which must be disregarded unless the revenue is also taken into account, the comparison stands as follows :—

	Rs.
Outlay on works and repairs	48,66,615
Cost of establishment	12,44,676
Percentage...	25·6

4. The department as now constituted is arranged and distributed as follows :—

Division.	Executive Charges.	Area in square miles.	Outlay on Works and Repairs, 1888-89.					
			Provincial, including Contribution.	Local.	Imperial.			Total.
					Military.	Civil Works	Irrigation.	
Chief Engineer, Northern Division.	Executive Engineer, Presidency	...	5,41,641	222	1,995	44,136	...	5,87,994
	Architectural Executive Engineer and Surveyor.	...	...	...	...	...	...	...
	Executive Engineer, Military Works, Bombay ...	...	12,701	...	3,61,600	78	...	3,74,379
	Do. Ahmedabad (including Bhúj)	3,821	1,22,781	58,251	56,568	28,665	39,413	3,05,678
	Do. Surat and Broach ...	3,115	82,460	1,19,324	1,382	1,947	24,866	2,29,979
	Do. Kaira and Panch Mahâls ...	3,221	68,524	1,36,078	7,703	3,343	957	2,16,605
	Do. Thána	4,242	93,033	81,879	608	8,277	...	1,88,797
	Total ...	14,399	9,26,140	3,95,754	4,29,856	86,446	65,236	19,03,432
Superintending Engineer, Central Division.	Executive Engineer, Poona and Kirkee ...	5,347	1,77,267	6,629	1,52,952	266	...	3,37,114
	Do. Poona District		1,13,372	51,694	24,653	268	...	1,89,987
	Do. Poona Irrigation ...		51	249	3,129	...	63,936	67,365
	Do. Nira Canal		...	89	...	...	3,02,421	3,02,510
	Do. Násik	5,940	68,074	46,023	...	910	26,833	1,41,840
	Do. Ahmednagar	6,666	94,089	50,919	71,362	85	13,993	2,30,448
	Do. Khándesh	9,943	2,54,644	81,916	4,382	993	...	3,41,935
	Do. Khándesh Irrigation ...		155	219	...	...	62,637	63,011
	Do. Sholápur	4,521	57,750	50,003	584	2,375	25,940	1,36,652
	Total ...	32,417	7,65,402	2,87,741	2,57,062	4,897	4,95,760	18,10,862
Chief Engineer, Southern Division.	Executive Engineer, Sátára	4,987	1,32,252	60,339	11,308	496	35,332	2,39,727
	Do. Bijápur	5,757	82,042	24,978	...	222	265	1,07,507
	Do. Belgaum	4,656	2,53,077	32,624	45,623	461	...	3,31,785
	Do. Dhárwár	4,534	1,39,621	55,252	500	413	...	1,95,786
	Do. Belgaum and Dhárwár Irrigation		...	1,119	...	...	74,444	75,563
	Do. Kánara	3,910	1,70,485	9,279	...	797	...	1,80,561
	Do. Ratnágiri and Kolába ...	5,418	1,43,854	21,648	284	2,088	1,070	1,68,944
	Total ...	29,262	9,21,331	2,05,239	57,715	4,477	1,11,111	12,99,873
Superintending Engineer in Sind.	Executive Engineer, Lower and Central Sind ...	...	...	...	...	...	...	...
	Do. Eastern Nára	3,500	1,275	733	...	203	1,05,992	1,08,203
	Do. Fuleli Canals	3,387	13,972	2,045	22,551	104	2,49,640	2,88,312
	Do. Hyderabad Canals ...	5,660	43,462	1,915	...	1,211	2,30,590	2,77,178
	Do. Karáchi Canals... ...	6,865	1,20,392	13,959	59,246	9,552	1,48,310	3,51,459
	Do. Ghár Canals	3,800	3,858	8,527	...	139	2,36,506	2,49,030
	Do. Begári Canals	2,514	4,777	4,110	15,987	391	1,53,829	1,79,094
	Do. Shikárpur Canals ...	3,700	12,669	11,532	1,639	3,288	69,958	99,086
	Total ...	29,426	2,00,405	42,821	99,423	14,888	11,94,825	15,52,362
Superintending Engineer, West of India Coast Defences.	Executive Engineer, Aden...	...	17,699	6 328	92,743	1,363	...	1,18,133
Secretariat	Secretary to Government	...	...	...	...	...	...	...
	Under Secretary to Government	...	...	...	...	...	...	...
	Add—Outlay supervised by officers in charge, temporary Defence Offices (excluding that on the Defences)	...	692	...	1,02,749	1,000	...	1,04,441
	Add—Outlay by Civil Officers, and Suspense balances	...	8,660	...	5,431	8,425	...	22,516
	Total ...	...	28,40,329	9,37,883	10,44,979	1,21,496	18,66,932	68,11,619

Of the Executive charges, the Poona Irrigation, Nira Canal, Khándesh Irrigation and Belgaum and Dhárwár Irrigation charges in the Deccan are wholly or almost wholly irrigation charges; in the others, the Executive Engineers supervise the whole work of the department in the several districts, whether Imperial, Irrigation, Provincial or Local.

5. The operations of the year under the heads Imperial Military and Imperial Irrigation are dealt with in separate reports. The present report treats only of Civil Works other than Irrigation, but the foregoing remarks refer to the organization of the department generally.

In India.	Rs.
Imperial...	1,48,824
Provincial	36,77,266
Contributions	92,751
Local Funds, Incorporated	9,54,954
Local Funds, Excluded .	1,12,497
Grand Total . .Rs.	49,86,292

6. The total expenditure of the year on Civil Works, Imperial and Provincial, Local Funds, Incorporated and Excluded, and Contributions, was Rs. 49,86,292 as per margin. In round figures the expenditure on New Works was 21 lákhs; on Repairs 18 lákhs; on Establishment 10¼ lákhs: and on Tools and Plant ¾ lákhs.

7. Considerable progress was made in meeting the more urgent requirements of the several districts as regards buildings and roads. A very marked feature of the year's operations was the commencement of a large extension of the Hospital accomodation in Bombay, the cost of which, with the exception of that of the much-needed European General Hospital, is wholly provided by private institutions. Details will be found under the several heads.

II.—CIVIL WORKS.

I.—CIVIL BUILDINGS.

I.—IMPERIAL SERVICES.

8. The expenditure under this head was Rs. 1,48,824, divided as under :—

	Rs.
Original Works	59,531
Repairs	61,965
Establishment	25,935
Tools and Plant	1,393

The works carried out were as follows :—

2.—CUSTOMS.

9. The only work under this head, during the year, was the removal of the old Custom Master's Office at Máhim, and the construction of a new one in its place, at a cost of Rs. 3,059.

3.—SALT.

10. The following buildings for the Salt Department have been completed during the year: A Sir Kárkún's Kacheri at Omele; a Custom Kacheri at Maroli, and a Custom Chauki at Versova, all in the Thána Collectorate; the alterations to the covered salt shed at Khárágheda in the Ahmedabad Collectorate, have also been completed.

6.—POST OFFICES.

11. In consequence of the very defective condition of the drainage of the General Post Office, Bombay, the W. C. and soil pipes were removed from the centre of the building, and re-arranged so as to be cut off from the rest of the accommodation as far as possible, the soil pipes being placed outside. The work of constructing joint latrines for the Post and Telegraph Departments in Bombay, described in the last year's report, was completed.

A combined Post and Telegraph Office has also been constructed at Keamari, Karáchi.

7.—TELEGRAPHS.

12. Two important buildings in connection with telegraphs were completed during the year, in Bombay, *viz.*, the extension of the Central Telegraph Office, at a cost of Rs. 1,53,172; and the construction of a branch Telegraph Office at Mándvi, at a cost of Rs. 21,569. Both these buildings have been described in previous reports. Certain petty improvements and additions have also been made to the Central Office, Bombay, to the offices at Alahyar ka Tanda and Sukkur, in Sind, and to that at Ormara in the Persian Gulf.

II.—PROVINCIAL SERVICES.

13. The expenditure from Provincial Services and Local Funds and Contributions, under this head (and including the outlay on Forest and Customs buildings) was Rs. 19,26,499, divided as under :—

	Rs.
Original Works	11,19,048
Repairs	3,54,973
Establishment	4,29,195
Tools and Plant	23,283

12.—ADMINISTRATION.

14. Under this head, Mámlatdárs' Kacheris, on the standard plan, were completed at Chikodi in the Belgaum, Sangamner and Akola in the Ahmednagar, Jámner and Sakri in the Khándesh, and Dhandhuka in the Ahmedabad Collectorates. Others were in progress at Sháháda and Nawápur in Khándesh, and at Kapadvanj in Ahmedabad; and additions and alterations to Mámlatdárs' Kacheris are in progress at Taloda in the Khándesh, and have been completed at Thána in the Thána Collectorate. The conversion into Kacheris, of the old Treasury building at Dhárwár, and of the Pendall at Wadgaum in the Poona Collectorate, was also carried out.

15. The building for the State and Alienation records, at Poona, alluded to in former reports, has been pushed forward, and the greater part of the superstructure has been completed; besides this, record accommodation has been provided at Olpád in the Surat, and at Roha in the Kolába Collectorate.

16. A Mahálkhari's Kacheri has been completed at Halol in the Kaira Collectorate.

17. In Sind, besides petty additions and improvements, the only work of importance was a Mukhtyárkari's Kacheri at Bago Tando, which was completed at a cost of Rs. 19,300. Additional record accommodation for the Collector's Kacheri at Karáchi, was also in progress.

18. At Bijápur, in connection with the scheme for the adaptation of certain ancient buildings for the requirements of the head-quarter station, the new civil hospital, mentioned in the last report, was completed, and the whole scheme, with the exception of the conversion of the Gajan Mahál gateway into a church, which awaits some of the sanctioned articles of furniture, has been carried out.

19. The only work in connection with Government houses, was the fixing of a new cooking range at Ganesh Khind, and the attachment of the circulating boiler to the hot-water system of the house.

20. The new public offices in progress at Broach have been considerably advanced, and have now nearly attained roof level, and the detached buildings for the Mámlatdár's Treasury, &c., have been completed; the total expenditure to end of the year has been Rs. 37,400, against the estimate of Rs. 53,539.

21. A distillery at Dhulia, which is on a large scale, and which is intended to serve Central Khándesh, is in progress; the total estimated cost is Rs. 1,12,271. The building is being constructed by the liquor contractor, on his own plans, and is approaching completion. It will be connected with the Bombay-Agra road by an approach half a mile long, which is now in progress departmentally.

22. New distillery buildings were also commenced at Surat; the estimated cost is Rs. 77,173. The concreting of the foundations is in progress. The building when completed will contain the following accommodation:—One still shed, 157′ × 30′; one fermenting-shed, 114′ × 12′; one mowra refuse shed, 128½′ × 12′; four mowra store-rooms, two, each 55′ × 20′, and two, each 54′ × 20′; an Inspector's office, and guard-room, and quarters for the Inspector and distiller. There is also a boiler-shed 32′ × 50′, with space for two boilers.

24. At Ahmedabad the alterations, and additions to the distillery, commenced last year, were completed, with the exception of a few minor items.

23. The new bungalow at Sádra for the Political Agent, Mahi Kántha, as described in last year's report, has been completed at a cost of Rs. 20,444; and the district bungalow at Bulsár in the Surat Collectorate is approaching completion.

14.—LAW AND JUSTICE.

25. During the year new Subordinate Judges' Court-houses, on the standard plan, were in progress at Shirpur in the Khándesh, and at Umreth in the Kaira Collectorates; and one at Nadiád, in the Kaira Collectorate, was completed. The old Mámlatdárs' Kacheris, at Karjat and Ráhuri, in the Ahmednagar Collectorate, were, besides, converted into Court-houses.

26. At Poona, an upper-storied building, containing the Cantonment Magistrate's office and rooms for the Committee and office staff, &c., has been completed. The cost was met from Cantonment funds.

27. The largest undertaking under this head, which has been brought to a state of completion, are the new buildings for the Police Magistrates' Courts at Bombay, fully described in previous reports, and which are now practically completed, at a total cost of Rs. 3,55,522.

15.—ECCLESIASTICAL.

28. St. Mary's Church, Poona, has been completely reseated, at a cost of Rs. 3,170 the new sittings affording accommodation for 718 people.

29. A new building for the Trinity Church, in connection with the Indo-British Institute, is now being constructed from the designs of the Architectural Executive Engineer and Surveyor, in Bombay, the expenditure being met from contributions. It will afford accommodation for 200 seats, and consists of a nave 57′×30′, a chancel 23′×26′, a vestry 13′×10′, a baptistry 14′×10′, and a portico. The building was raised up to a level of about 8′ in height, during the year; the expenditure during the year was Rs. 4,873, against the estimate of Rs. 30,719.

30. The Roman Catholic Chapel at Baroda was completed during the year, the total expenditure having been Rs. 15,684.

16.—JAILS.

31. The only work of any importance carried on during the year, was the construction of the Juvenile Reformatory at Yerrowda, near Poona, described in the report for 1884-85, which was practically completed at a cost of Rs. 76,894, which included the cost of an approach road with masonry road dams and drains; the earth work of the road was carried out by the Jail Department.

17.—POLICE.

32. Considerable progress was made with the construction of quarters for the District Police throughout the Presidency. In all, lines for 509 men were completed or in progress. Lines were completed during the year at Haliyál and Supa in the Kánara Collectorate; Chipún and Guhágar in the Ratnágiri Collectorate; Gadag in the Dhárwár Collectorate; Khánápur in the Belgaum Collectorate; Ráhuri in the Ahmednagar; Manmad and Tulwada in the Násik; Navápur in the Khándesh; Dákor and Mahudha in the Kaira Collectorates; and at Bágo Tando, Mirpur Batoro and Johi in Sind; and are in progress at Hukeri in the Belgaum; Hungund in the Bijápur; Mukti, Sákri and Sháháda in the Khándesh; Hálol and Godhra in the Kaira; and Ránpur in the Ahmedabad Collectorates. Police lines for Treasury Guards at Shrígonda, Karjat and Akola in the Ahmednagar, and Niphád in the Násik Collectorates, have been completed; additions and alterations were carried out to the head-quarters of the Town Police at Jacobabad; and 5 pendalls have been constructed for the armed Police at Hyderabad, Sind, at a cost of Rs. 18,856.

33. Lines for the Rewa Kántha Police at Godhra, as well as the Police lines, treasure-room and cells at Pandu, were completed at a total cost of Rs. 11,586, as contribution works.

34. A portion of the Criminal Jail at Sholápur is being converted into Police lines and the work is in progress; Rs. 5,989 having been expended, against the estimate of Rs. 18,336.

35. A Police outpost at Kásegaon in the Sholápur Collectorate has been completed.

36. In Bombay, the only work under this head was the construction of a new Police chauki on the Erskine Road; another chauki is shortly to be erected at Byculla, and the site has been purchased for Rs. 6,500.

18.—EDUCATIONAL.

37. The following works in Bombay were carried out, or completed during the year:—

The new building for the Elphinstone College and State Records was entirely completed, and wrought iron record shelves for that portion of it, occupied by the State Record office, were commenced.

The work on the east wing of the Cathedral High School, which was resumed last year, was completed; the total cost of the building amounting to Rs. 1,82,721.

The main block of the new Wilson College buildings was completed; as was also the work of filling in the tank in the compound of the David Sassoon Industrial Institution.

Besides the above, the additions to the Veterinary College at Parel, mentioned in last year's report, were completed.

38. The Municipal School at Bijápur, called the Victoria Jubilee School, mentioned in the last year's report, has been completed at a cost of Rs. 6,821. Certain additions and alterations to the subsidiary buildings at the Training College, Dhárwár, have also been completed at an outlay of Rs. 2,873.

39. A Lecture Theatre at the College of Science at Poona is in progress, and the superstructure has been finished. The accommodation of the building, when completed, will consist of a Lecture Hall 42′ 9″×35′, a Chemical Laboratory 20′×35′, balance-room, office, and store accommodation. An Observatory for the College of Science, Poona, described in last year's report, was completed at the total expenditure of Rs. 6,565, against the estimated cost of Rs. 7,921. Certain additions and alterations to the work-shops were also carried out.

40. The following buildings for the Poona Convent School are in progress:—St. Anne's School, consisting of a School-room 22′×24′, 2 class-rooms 16′×24′ and

12′×24′, and a Teacher's room; also auxiliary buildings consisting of a sick ward, 26′×18′, a dispensary and a linen room, with offices; there is also a small detached building containing bath and store rooms.

41. The residence and school buildings for the Sisters of St. Mary's Home, Poona, described in the report for 1887-88, were in progress. The foundation stone of this building was laid in August 1888, and up to the end of the year the foundations, plinth and superstructure of the ground-floor were completed; the superstructure of the oratory was carried to a height of 15 feet, and the framing for the superstructure, and the roof over the dormitories, erected.

42. The construction of a Gymnasium at Surat is in progress, but only the foundations and plinth have been completed; the building when finished will be 60′×24′, and will cost Rs. 5,268. A Lecture Hall and Laboratory, at a cost of Rs. 11,734, half of which is defrayed by the sons of the late Mr. Tapidas Varjdas, whose name it will bear, is in progress.

43. At Ahmedabad, considerable alterations and additions to the Premchand Roychand Training College, which were described in last year's report, have been completed.

44. Local Fund School Houses are in progress at Mirájgaon, and have been completed at Pimpalwandi, Walki, Kanhur, Amalner, Pimpalgaon (Malvi) Dongurkini, Chanda, Jávala, Nighoja and Wagsunda in the Ahmednagar; at Pimpalgaon (Buswunt) in the Násik; at Gawal in the Khándesh; and at Tárápur in the Thána Collectorates.

45. In Sind, a Training College has been commenced at Hyderabad; the building, when complete, will contain accommodation for 35 students, and will be provided with a lecture hall, six class-rooms, dining-rooms, &c. The old Training College has been added to and altered, and the work is practically completed.

19.—MEDICAL.

46. Owing principally to munificent private donations, a considerable extension of the Hospital accommodation in Bombay was undertaken during the year. The following are the particulars of the several donations:—

(1). In January 1888, the Hon'ble Sir Dinshaw Maneckji Petit, Kt., placed at the disposal of Government the sum of Rs. 1,25,000, which, it was decided, with the donor's consent, in July 1888, should be applied to the erection of a Hospital for the treatment of the diseases of women and children, on a site adjoining the Jamsetji Jijibhoy Hospital.

(2). Bai Motlibai, the widow of the late Mr. Manekji Nowroji Wadia, similarly in April 1888, presented the sum of Rs. 1,50,000, together with an extensive and valuable site adjoining the Jamsetji Jijibhoy Hospital, which is to be devoted to the erection of an Obstetric Hospital.

(3). The Trustees of the estate of the late Mr. Bomanji Edulji Allbless placed at the disposal of Government the sum of Rs. 66,000, of which Rs. 60,000, bequeathed by that gentleman, is to be devoted to the erection of an Obstetric Hospital on a site adjoining the Cama Hospital, and Rs. 6,000 contributed by the Trustees themselves and the sons of the late Dadabhoy Edulji Allbless, is to be utilized to meet part of the cost of quarters for the Resident Lady Physicians of both Hospitals. This gift was subsequently further increased by Rs. 6,000, for furniture, and for providing a separate Mortuary for deceased Parsis.

(4). Rs. 30,000 were paid in to the credit of Government by the late Mr. Sorabji Cowasji Powvalla, for the construction, as a contribution work, on a site granted by Government, of a building for the Fort Gratuitous Dispensary.

(5). Mr. Dvarkadas Lallubhai gave a donation of Rs. 10,000 (with Rs. 1,000 in addition for fittings), originally intended for a cholera ward, but which, with the donor's consent, is to be applied to the erection of an out-door Dispensary for women and children, in connection with the Hospitals to be built from the gifts of Sir Dinshaw Manekji Petit and Bai Motlibai.

(6). Finally, it may be mentioned here, though properly pertaining to the head Education, that at the close of the year, Mr. Framji Dinshaw Petit placed at the disposal of Government a sum of Rs. 75,000 for the purpose of erecting and fitting a Laboratory for scientific medical research in connection with the Grant Medical College, attached to the Jamsetji Jijibhoy Hospital.

The Department was engaged during the year with plans and estimates for each of these schemes, and though the commencement of some was delayed until after the close of the year, the facts are recorded as forming part of the year's operations.

47. These considerable private donations provide very fully for the immediate wants of the City of Bombay, as respects Hospital accommodation generally, but there remains what has been regarded for years as a most pressing requirement—suitable buildings for the European General Hospital. The accommodation at present available for the reception and treatment of the large number of sick Europeans from the Navy, the Shipping, and resident European population, and from a considerable portion of that community residing within reach of the Railway lines up-country, has been provided by adapting certain of the old Barracks in Fort

George, and is insufficient and unsuitable. The construction of a new Hospital adapted to requirements has been under consideration for many years. In the year under report a general plan of the new Hospital was, after much discussion, approved, and designs and estimates for the more urgently necessary portions thereof were sanctioned. These include quarters for the Lady Superintendent, Sisters, Nurses and Probationers, and a new Male Hospital.

The foundation stone of the latter building was laid with some ceremony by His Excellency the Governor in February 1889; the nurses' quarters having previously been commenced.

The designs are plain and without attempt at any external embellishment, attention having been given to secure a maximum of accommodation, comfort and convenience, at a minimum of expense.

The new Hospital is situated in the ruins of the old Fort George, and is to be called henceforth, St. George's Hospital.

The Nurses' and Probationers' quarters are to consist of a ground and two upper floors. On the ground floor there will be a sitting-room, a dining-room and an office, and two bedrooms with bath-rooms, &c. On the first and second floors there will be eight bed-rooms, with bath-rooms attached.

The Lady Superintendent's and Sisters' quarters consist of a ground and an upper floor. The ground floor will contain a sitting-room for the Lady Superintendent, a general sitting-room, a dining-room and an office. The upper floor is to contain a bed-room for the Lady Superintendent, with a bath and dressing-room, and five other bed-rooms with bath-rooms.

The male ward of the hospital is to be 318 ft. 9 in. long, and 118 ft. 9 in. wide. It is to consist of a ground and two upper floors. On the ground floor there are to be three general wards giving accommodation, in the aggregate, for 40 beds, and a special ward for one bed, two rooms for nurses and a dining and reading-room. On the first floor there are to be two wards, each containing 14 beds, and a special ward for one bed, two nurses' rooms, a chapel for religious services, a dining, operating and dark-room, and a general store-room. On the second floor there are to be two wards, each accommodating 14 beds, two smaller wards for special cases, of one bed each, a reading, a dining and a nurses' room. Over the porch there are two large rooms: that on the first floor is to be the Physician's private room, and that on the second floor the Physician's office. Attached to each floor there are bath-rooms, lavatories, &c. In the rear of the hospital there is to be a detached block connected with the main building by a passage, in which accommodation is to be provided for a dispensary and offices, and store-rooms for an apothecary, a steward and an overseer.

There is also to be a detached building, connected with the main building by a passage, in which there will be a cook-room, scullery and a store-room. The whole of the main building is surrounded by corridors, which extend to the blocks on the flanks, containing bath-rooms, &c.

The basement is vaulted, providing a free air space between the floors and the ground. The cook-house and office block are connected with the main hospital by covered passages. There is a main stair-case in the centre of the building, and two lifts are provided, one in the stair-case chamber, and the other at the end of the passage from the cook-house.

The accommodation provided in the wards gives from 120 to 125 square feet, and from 2,160 to 2,958 cubic feet per bed.

The accommodation is liberal but not extravagant; it fulfills sanitary requirements as to superficial area and cubic space, and the building is cheap and more economical than any of the previous projects.

The buildings have been designed by the Architectural Executive Engineer and Surveyor. The sanctioned estimate for the hospital for males amounts to Rs. 4,59,738. Those for the quarters above described, including servants' houses, stables, cook-rooms, water supply and drainage, amount in the aggregate to Rs. 1,09,929. The total expenditure on these works during the year has been Rs. 6,184.

The progress made to end of the year was confined to the Nurses' and Sisters' quarters, but preliminaries, with a view to the vigorous prosecution of the new male hospital in the ensuing year, have been arranged.

48. The foundation stone of the Bái Motlibái Hospital was laid by His Excellency the Governor on 9th March 1889. The site known as the Parsonage át Mázgaon, adjoins the Jamsetji Jijibhoy Hospital. The design for the building was prepared by the Architectural Executive Engineer and Surveyor, and the foundations are now in progress. The extreme length of the building is to be 162 ft. 6 in., and the extreme breadth 128 ft. 3 in. It is to consist of a ground and a first floor, and the central feature is to have an additional floor. The ground floor will contain an entrance hall, porch, and staircase, two matrons' rooms, two wards for 8, and two for 2 beds each, an operating, microscope, office, linen, dispensary and store rooms. There will also be a detached building containing the necessary offices, &c. On the first floor accommodation for a similar number of beds is provided. The Hospital thus provides for a total of 40 beds; and on the second floor quarters are provided for an Assistant Surgeon. The sanctioned estimate for the main building amounts to Rs. 1,37,657.

49. The construction of a building for the Fort Gratuitous Dispensary, funds for which have been furnished by Mr. Sorabji Cowasji Powvalla, was commenced during the year. The building designed by the Executive Engineer, Presidency, is to consist of a ground and first floors. On the ground floor there will be a dispensary and separate waiting rooms, with staircases for males and females, and on the upper floor, a consulting room, two examination rooms, and store-rooms, &c. The total outlay on the work to end of the year has been Rs. 7,732, against an estimate of Rs. 31,509.

50. The foundation stone of the Bomanji Edulji Allbless Obstetric Hospital was laid by His Excellency the Governor in February 1889, and the work had made considerable progress by the end of the year. The site adjoins the Cama Hospital. The building has been designed by the Executive Engineer, Presidency, and will contain accommodation for 31 in-door patients, a waiting-room, labour ward, and matrons' quarters. The estimated cost is Rs. 60,176.

51. The need having been felt at the Cama Hospital, for quarters for a Resident Physician, it was resolved that a separate building should be erected on the open ground to the north-west of the Cama Hospital, for the use of the Resident Physicians of the Cama and Allbless Hospitals. The work has been commenced, and will contain accommodation for two Lady Doctors. The cost is to be met as follows :—

Allbless contribution	Rs.	6,000
Saving in Estimate for Female Students' Quarters, being part of sums contributed by Mr. P. H. Cama (Rs. 15,000) and the Bombay Branch of the Countess of Dufferin Fund (Rs. 10,119)	„	1,996
Balance of Mr. Cama's contribution for the construction of the Cama Hospital	„	4,803
Grant from the Bombay Branch, Lady Dufferin Fund ...	„	5,000
Interest on contribution	„	535
		18,334

52. Negotiations were in progress for the acquisition of a plot of ground in rear of the Jamsetji Jijibhoy Hospital and adjoining the old Parsonage (now the Motlibai Hospital site) for the erection of the Lady Sakarbai Petit Hospital, and Dvarkadas Lallubhai Dispensary. These have since been completed, but in the year under report no progress was made with the projects beyond preparing plans and estimates for the buildings.

53. The foundation stone of the Framji Dinshaw Petit Laboratory of Scientific Medical Research was laid after the close of the year. An account of the building, &c., will be given in the report for 1889-90.

54. The additions to the subsidiary buildings of the Lunatic Asylum at Ratnágiri referred to in last year's report, were completed.

55. A ward for the detention of suspected lunatics has been added to the Sassoon Hospital at Poona. It affords accommodation for two male, and two female patients.

56. Dispensaries are in progress at Shirpur, Taloda, Amalner, Sávda, Yával and Dharangaon in the Khándesh, and Kalol in the Kaira Collectorates. They are all on the standard plan, expenditure being limited by the extent to which funds are available. In Sind, a dispensary at Dokri has been completed, and another commenced at Shahdádpur.

20. MISCELLANEOUS.

57. Additions and alterations to the Hydraulic Press building in Bombay, now occupied by the Government Central Press, described in the last year's report, have been completed during the year, at a total cost of Rs. 50,124; and permanent latrines have been added for the employés of the Central Press.

58. Additions and alterations to the Executive Engineer's Office, Ahmedabad, which were in progress last year, have been completed.

59. The work of dismantling and rebuilding the granary at the Experimental Farm, Bhadgaon, is in progress. The old granary was badly founded, and when special repairs were called for, was found not worth repairing. A new granary of similar size, 73′ × 39′, was sanctioned instead, and is being built on a better site. The amount of the estimate is Rs. 4,000, and the expenditure during the year Rs. 1,180.

II.—COMMUNICATIONS.

60. The total outlay on communications was Rs. 26,39,675 divided as under :—

Original Works	Rs.	7,69,669
Repairs	„	13,22,484
Establishment	„	5,11,654
Tools and Plant	„	35,868

I.—ROADS.

61. A map in three sheets is attached, on which are shown the principal lines of roads in progress during the year.

62. The following new roads have been in progress :—

(1). *Road from Nipáni to Mahálingpur, crossing the West Deccan Railway at Chikodi Road Station, Belgaum Collectorate, 33 miles long.*—The 1st section of this road was completed and opened for traffic, and many of the drains and bridges in the 2nd section have been completed also ; and the road surface has been murumed, but not yet consolidated for want of rain. Earth-work in the 3rd and 4th sections is in hand. The total expenditure to end of the year has been Rs. 1,95,063, against the estimate of Rs. 3,58,257.

(2). *Road from Hukeri to Gokák, Belgaum Collectorate, 18 miles.*—This road has been murumed and consolidated, and a paved causeway was half completed ; one bridge only being required to complete the road. The total outlay to end of the year has been Rs. 1,66,499 against the estimate of Rs. 2,22,718.

(3). *Road from Gokák towards Navalgund, in the Dhárwár Collectorate, 45 miles* ; on which satisfactory progress was made.

(4). *Road from Salao to Korlai, in the Kolába Collectorate, 2 miles.*—A short local road, on which Rs. 3,249 have been spent during the year, against the estimate of Rs. 5,359.

(5). *Road from Pusegaon to Vaduj, Sátára Collectorate.*—A local road described in last year's report. It was in progress for a portion of the year, when work was suspended for a revision of the estimate.

(6). *Road from Ghoda to Ambegaon, Poona Collectorate, 11 miles.*—The estimated cost is Rs. 46,849 and the expenditure during the year Rs. 2,035. This road will connect Ghoda, the chief town in the Ambegaon Petha, with Ambegaon, 11 miles distant, and will be a second class murumed road ; it traverses a district at present almost wholly devoid of communications ; cross drainage will be provided by means of culverts, slab drains and road dams. This road, together with No. 9 (Jamgaon-Kotul road) and No. 11 of paragraph 64, are parts of a scheme for opening up the hilly tracts of country in the north-west of the Poona, and the west of the Ahmednagar districts, inhabited by Kolis and Rámosis, whose condition will, it is hoped, be thereby improved. The works in themselves are intended to afford employment to the people, and will gradually improve the value of their crops and of the Government forests. An annual assignment of Rs. 20,000 has been sanctioned from Provincial Funds, and the Local Boards of the two districts have agreed to contribute Rs. 4,000 in all, annually, for the purpose of carrying out the scheme. The matter has been carefully inquired into, and the project will be systematically carried into effect. The roads on completion will be maintained by the Local Boards.

(7). *Feeder road from Khadke viâ Nevása to Belápur Railway Station, Ahmednagar Collectorate, 24 miles.*—The road was nearly completed last year, and some expenditure incurred on it in the year under report ; but for want of funds it was not finally completed.

(8). *Feeder road from Khospuri to Vámbori, Ahmednagar Collectorate, 6½ miles.*—This road was commenced in 1883-84, and very little remains to complete it ; the road is open for traffic.

(9). *Jamgaon-Kotul road, Ahmednagar Collectorate, 12 miles.*—This road was commenced during the year. It is one of the scheme of roads already referred to, for opening out the mountainous country lying between the Násik and Poona Collectorates. It connects the two important market towns of Rájur and Kotul, and reduces the distance from Kotul to the G. I. P. Railway, from 54 to 40 miles.

(10). *Road between Tásgaon and Páthardi, Ahmednagr Collectorate, 7½ miles.*—A local road. It was in progress last year, but its completion has been delayed for want of funds. It is, however, practicable for carts. The expenditure to end of the year has been Rs. 22,577, against the estimate of Rs. 31,694.

(11). *Goldari and Ozar (local) road, in the Peint Táluka of the Násik District.*—This is simply a country track, and in extension of the Harsul, Thána and Goldari road. It is being completed piece by piece, according to the grant sanctioned each year.

(12). *The Hasteh and Barhe road.*—This road is in the Peint Táluka of the Násik Collectorate, and is in extension of the line starting from the foot of the Nanashi Ghát, passing *viâ* Gandole and Hasteh, and is intended to open the forest tract.

(13). *Road from Yával to the river Tápti, Khándesh Collectorate, 9 miles.*—This road is still in progress, and will be completed during the rains of 1889, if possible. It forms part of the road from Bhusával to Yával, total length of which is 11 miles. The part from Bhusával to the Tápti has been completed separately, and is bridged ; the part from the

river to Yával has been finished and is in use for half the length. *viz.*, 4½ miles; most of the earth-work has been completed throughout; the whole length is, or is to be bridged, except at three nálas, where level-crossings are adopted instead. The amount of the estimate is Rs. 75,400, and the expenditure to end of the year, Rs. 53,910.

(14). *Road from Songir to Nandurbár, 4th section, from Ranála to Nandurbár, Khándesh Collectorate.*—This is a local road, 12 miles in length. It is likely to be completed during the next monsoon, and is in use for half the length. It will complete the connection of Nandurbár with Dhulia, a total distance of 56 miles.

(15). *Dondaicha-Sháháda Road, Khándesh Collectorate.*—A local road, 17 miles long, which is being carried out as funds are available. The work during the year has been confined to making the road passable from Dondaicha to the river Tápti, 8 miles; half of this length is in use and the remaining portion will probably be finished during the next rains. Most of the earth-work beyond the Tápti has been finished.

(16). *Dhulia-Amalner Road, 1st section, Phagna to Chopdai, Khándesh Collectorate.*—A local road, 7 miles long, practically finished, with the exception of consolidation of the latter half, which was hindered for want of rain.

(17). *Dáhánu-Jawhár road, in the Thána Collectorate, 26 miles.*—Three additional drains have been constructed on this line, which has been described in previous reports; and the road, with the exception of metal, is nearly completed, and is used for traffic. The work of metalling is in progress.

(18). *Road from Váda to Shirghat, in the Thána Collectorate, 31 miles.*—The earth-work, rock cutting, &c., has been completed for about 16 miles, and about 60 drains and culverts finished. There was a good deal of sickness among the work people in the beginning of the season. The total outlay to end of the year has been Rs. 39,251, against the estimate of Rs. 90,954.

(19). *Road from Chahad Khind to Manori, in the Thána Collectorate, 6 miles.*—The first two miles of this road were opened to traffic in November 1888, and the earthwork to Manori is nearly completed; 14 drains and culverts have been constructed.

(20). *Roads from Kulwa to Belápur, Bháyndar to Utan, Borivli to Gorai, and Malad to Merva.*—Local roads in the Salsette Táluka of the Thána Collectorate. Work was carried out on these roads as far as funds were available. The last two are chiefly over salt marshes, and an unusually high tide showed that the proposed formation of the roads required to be raised.

(21). *Road from Baad to Bibipara, in the Kaira Collectorate.*—This road is completed, with the exception of the bridge over the Vátrak River, which is in progress.

(22). *Road from Bibipara to Modása, viá Dhansura.*—The road is a continuation of the Dakor and Baad line, and has been completed, with the exception of one bridge, the superstructure of which has been carried up to springing level. The road is now open for traffic.

(23). *Branch road from Kapadvanj to Sunda, Kaira Collectorate, 7½ miles.*—This road was commenced before the close of the year, principally for the purpose of affording employment in case of distress arising from the previous season of drought in this portion of Gujarát. It is 7½ miles in length, and forms the connecting link between the road running northwards to Modása *viâ* Baad, Bibipara and Dhansura, and that joining Kapadvanj with the Railway at Dákor. This link has been hitherto left untouched as it was uncertain whether the traffic would follow the direct route to the railway south of Sunda, or follow that *viâ* the town of Kapadvanj. The road is to be embanked, bridged and metalled, and is estimated to cost Rs. 34,726.

(24). *Road from Viramgaon to Hansalpur, Ahmedabad Collectorate.*—A local road, about 2 miles long, 20 feet wide. It was commenced last year; the earthwork has been completed.

(25). *Road from Ahmedabad to Bareja, Ahmedabad Collectorate, 11 miles.*—The object of this road is to connect Ahmedabad with the Kaira system of roads at Bareja. It begins at the Dholka road, at a point 1,300 feet from the Jamalpur Gate, and runs in a southerly direction; it is eleven miles long, with a branch from Chandola to Shahallum, nearly one mile long, connecting it with the Astodia Gate of Ahmedabad City. The road is to be 18′ wide, with side slopes 1½′ to 1′, and 24′ wide (including side drains) in cutting, and is to be covered with river kunker 12′ in width, on a layer of burnt bricks; the necessary waterways will also be provided. During the year a sum of Rs. 6,043 has been expended in making embankments for a length of 2¼ miles, with the necessary masonry works. The estimate for the project is Rs. 1,29,500.

63. The following roads have been completed during the year:—

(1). *Yedsi-Tadwala Road, in the Sholápur Collectorate.*—This road is 8 miles long and metalled throughout. Two culverts, each of 3 spans, 4 slab drains and 13 road dams have been constructed, and catch-water drains and kerbing provided. The road is open to traffic.

(2). *Causeway across the Krishna River, Sátára Collectorate.*—This work is in connection with the feeder road from the town of Karád to the Karád railway station, in the Sátára Collectorate.

(3). *Poona Awlas (local) road.*—The road dams on this road are for the improvement of the made road from Poona to Poad, and have been practically completed at an outlay of Rs. 9,566, against the estimate of Rs. 9,788. The section, Paod to Awlas, on the Ghat, is at present only a country tract.

(4). *South approach to the Godáveri River.*—This work is situated near Toka, in the Ahmednagar Collectorate, on the Toka road. It was commenced in October 1887 and comprises three slopes or stages forming a zigzag; the lower slope only, which gets the greatest scour, is paved; the two upper ones being metalled. It is completed and open for traffic. The approach on the opposite bank, which is of the same design, was begun in 1887 by His Highness the Nizám's Government, but is not completed.

(5). *Babulgaon-Takli (local) Road, Ahmednagar Collectorate.*—The length of this road is 3¼ miles, of which 1¼ was constructed last year.

(6). *Násik-Dindori and Kalvan Road, Násik Collectorate.*—This is a local line, 44 miles long, and is divided into four sections. The three sections up to the 32nd mile were already completed, with the exception of a few masonry works in sections 1 and 2. The 4th section has now been fully completed, and the road is passable from end to end.

(7). *Road from the Majoora Gate of the city of Surat to the Pársi Tower of Silence at Bhurthana.*—A short line of road on which the expenditure has been Rs. 3,904.

(8). *Road from Godhra to Shera, Panch Maháls.*—The bridges and drains on this road are practically completed, and those on the Godhra-Sunth road will be finished in June 1890.

64. Improvements have been carried out to the following roads :—

(1). *Road from Bágerádi to Bail-Hongal, Belgaum Collectorate, 15 miles.*—A local road, on which the expenditure to end of the year has been Rs. 62,630, against the estimate of Rs. 86,988.

(2). *Palla-Bádámi Road, in the Dhárwár Collectorate, 21 miles.*—Improvements to two portions of this road, one between Miraj State (Junior) and Bankápur, 9½ miles long, and the other between Betgiri and Kotmachgi, 11½ miles, were carried out. On the former, three bridges and a culvert were nearly completed, and 2 miles have been metalled. On the latter two crossings have been completed, and 8 miles murumed and finished.

(3). *Road from Navalgund to Annigeri, Dhárwár Collectorate, 11 miles.*—Two drains were completed, and metal collected, spread and partially rolled on miles 7 and 8.

(4). *Second section of the Havanur-Samasgi road, Dhárwár Collectorate.*—29¼ miles long. Satisfactory progress was made with the improvements.

(5). *Road from Hungund to Ilkal, in the Bijápur Collectorate, 8 miles.*—This is an extension of the feeder road from the Bágalkot Railway Station to Hungund, and when completed will benefit the town and trade of Ilkal.

(6). *Road from Sakharpe to Sangameshvar, in the Ratnágiri Collectorate, 20 miles.*—The improvements to this road were described in previous years' reports, and have been completed during the year, at an outlay of Rs. 15,974, against the estimate of Rs. 15,984.

(7). *Varandha Ghát Dharmapuri Road, Sátára Collectorate, 46 miles.*—Progress in the improvements of this road was delayed, as the land required for them could not be taken up earlier. The outlay during the year was only Rs. 1,212, against the estimate of Rs. 3,558.

(8). *Road from Karabgaon to Talner, viá Nagansur, in the Akalkot State, Sholápur Collectorate.*—A local road 8 miles long. The earthwork has been finished, and the masonry work of drains, &c., are in progress.

(9). *Road from Akalkot to Sholápur (Local).*—The earthwork has been finished and the masonry work is in progress.

(10) *Road from Akalkot to Sangni, Sholápur Collectorate.*—This is a section, 4 miles in length, of the road from Akalkot to Vagdari, 12 miles long. The earthwork on this section has been finished, and masonry work nearly completed.

(11). *Road from Váda to Bhorgiri, in the Poona Collectorate, 15½ miles.*—This road is in the Khed Táluka, and lies in the upper part of the Bhima Valley, extending from Váda to Bhorgiri, at the foot of the Bhímáshankar Ghát, a distance of 15½ miles. The road is being re-constructed in order to open up the Forest and Ghát districts, forming the upper part of the valley, as explained under No. 9 of paragraph 51. The work consists in improving gradients and cross-drainage, providing masonry works (principally road dams to nála crossings), and re-forming and covering the road surface with murum. The work will be completed in May 1889.

(12). *Road from Sásvad to Jejuri, Poona Collectorate.*—Some small improvements were carried out at a cost of Rs. 2,828.

(13). *Bund Road at Poona.*—The unfinished portion of this work, which was described in the previous year's report, has been completed during the year, the outlay having been Rs. 6,502.

(14). *Stone paving in the bed of the Kot River, near Puntamba, Ahmednagar Collectorate.*—This causeway will be 210 feet long. The walls up and down stream are almost completed, and a portion of the roadway is covered with concrete and stone pavement.

(15). *The Sati-ghát Road, Násik Collectorate, 5 miles.*—The work of spreading metal, rolling and consolidation was carried out.

(16). *Godhra and Dohad Road, Panch Maháls, 43 miles.*—A special grant of Rs. 50,000 was sanctioned for the improvements of this road. Certain experiments have been made during the rains, on improving the surface, but owing to the scanty rainfall, these were not successful, and gave very little useful information as to the proper treatment of the line. In the case of one or two of the miles, however, it has been found that the treatment adopted has done good, and the road is improved. Other experiments will be made.

(17). *Road from Ahmedabad to Dholka, Ahmedabad Collectorate, 18 miles.*—This road is being raised and metalled. Rs. 30,194 have been spent up to end of the year, against the estimate of Rs. 1,37,913, the expenditure during the year having been Rs. 3,868, which has been spent in completing the line up to the end of mile No. 6, and in finishing the earthwork and collecting materials.

(18). *Road from Dhandhuka to Tagdi, Ahmedabad Collectorate, 6 miles.*—The improvements consist of providing dips and restoring portions of the embankments which were washed away.

65. Metalling has been completed or in progress on the following roads:—

(1). *Four miles of road in British territory, from Odgaon towards Miraj, Belgaum Collectorate.*

(2). *Road from the head of the Phonda Ghát to where it forks to Kolhápur, Belgaum Collectorate.*

(3). *Road from Byádgi to Motibennur, Dhárwár Collectorate, 3 miles.*

(4). *Road from Hubli to Sholápur, between Dandur Station road and Hebsur, Dhárwár Collectorate.*—The diversion of this road near the Hubli Station was also completed.

(5). *Road from Haliyál to Hingamnat, Kánara Collectorate,* 9 miles in length, leading to the railway station at Alnavar on the South Deccan line.

(6). *Portion of the Bombay-Agra Road beyond the river Tápti.*—This road enters the district of Khándesh at the Sahyadhri range of hills near Chándor, and leaves it at the foot of the Sátpudas, length 104½ miles; but for 1½ miles beyond, *i.e.*, to the top of the Bhorghar Ghát, or crest of the Sátpudas, in His Highness the Holkar's territory, the road is part of the district charge; total length 106 miles. The road is bridged throughout, except at the crossing of the river Tápti, where ferry boats are used when the river permits. The road is murumed from the Chándor hills to the River Girna, 18 miles, at which latter point it joins the metalled and completely bridged road from Manmad; the mileage onwards is reckoned from Manmad. From the Girna River, passing between the Cantonment and the town of Málegaon, and through the town of Dhulia, the road is metalled as far as the river Tápti, at 80—81 miles; beyond the Tápti all is murumed, except in so far as the work under reference is finished. This work proceeds slowly owing to great scarcity of labourers. The length is 28 miles, of which 12 miles are finished, except that the consolidation of half the width for half the length is imperfect. Another 9 miles are finished, but for half the width only; and collection for all the remainder, except 4 miles, is in progress. This will probably be finished by the end of next rains, and the remaining portion in the following year.

(7). *Dhulia-Surat Road, from Dhulia to Sondwa nála, Khándesh Collectorate.*—31 miles long, in the Khándesh Collectorate.

(8). *Dhulia-Chálisgaon Road, Khándesh Collectorate, 34 miles.*—The work of metalling was hindered by scarcity of labourers. The road was described in the previous year's reports. Probably 18 miles of full width, and one-half the width for the remainder, will be finished during the next rains, and the whole work in the following year.

(9). *Mhasvad-Dhulia Road, from Dhulia to Fagna, Khándesh Collectorate.*—A local road metalled for 4½ miles.

(10). *Songir-Nandurbár Road, from Songir to Dondaicha, Khándesh Collectorate, 23 miles.*—The work of metalling has been practically completed at a total expenditure of Rs. 46,869 against the estimate of Rs. 51,980. Some improvements to road dams are contemplated from the savings on the estimate.

(11). *Road from Bhiwndi to Váda, in the Thána Collectorate, 25 miles.*—The metalling is in progress; and the ford of the Tansa River has been paved.

(12). *Road from Balsár to Dharampor, in the Surat Collectorate.*—The last 9¼ miles are being murumed.

(13). *Wasad and Borsad Road, Kaira Collectorate.*—Work of metalling was completed on miles 5, 6 and 7; the remaining miles will be metalled during the next monsoon.

(14). *Kaira and Sábarmati Road, Kaira Collectorate, 12 miles.*—Materials are being collected for spreading an extra layer of kunker over certain miles.

(15). *Roads within the limits of the Godhra Municipality.*

66. The lining of the Kátraj tunnel on the Poona-Sátára road has been completed at a cost of Rs. 17,899, against the estimate of Rs. 19,648.

67. An Inspection Bungalow, with out-houses and tools shed, at Amalner, in connection with the Dhulia-Amalner road, is in progress, the expenditure during the year having been Rs. 312, against the estimate of Rs. 3,910.

2.—BRIDGES.

68. In the Belgaum District the timber-topped bridge over the Pandheri River, at Londa, described in last year's report, has well advanced towards completion, the total outlay to the end of the year having been Rs. 13,665, against the estimate of 14,479.

69. In the Kánara Collectorate, the bridge on the Bidralli Nála, on the Sirsi-Shimoga Road, was in progress. The work has been finished to top of piers. The iron girders obtained from England could not, owing to late receipt, be fixed in position. The total outlay to the end of the year has amounted to Rs. 15,691, against the estimate of Rs. 20,559.

70. In the Sholápur District the following bridges have been completed: A bridge of 3 arches, of 15 feet span each, on the Todwell Nála, on the Bársi-Pandharpur local road, in mile No. 20. A bridge of 2 arches, of 20 feet span each, on the Babulgam Nála, on the Bársi Station, Pandharpur local road, in mile No. 24. The construction of both these bridges is of stone and lime masonry, and the foundations are excavated to hard bottom and filled with concrete. The outlay has been Rs. 3,796, and Rs. 4,926, against the estimates of Rs. 3,797, and Rs. 4,939, respectively. A culvert of 3 spans, 10 feet each, has also been constructed on the Ashti Nála of the Barsi Station Pandharpur road, in mile No. 19, the construction being the same as the bridges.

71. The work of improving the crossing across the Degaon Nála on the Sholápur-Pandharpur (local) road has been completed. The crossing is a road dam about 300 feet in length, consisting of two side walls, 2 feet wide; the width of the roadway between the walls is 12 feet, filled in with a layer of 12 inches murum and 12 inches metal, well rammed, and consolidated. To prevent the water scouring behind the lower wall, an apron of loose boulders is provided in the bed of the nála, 5 feet broad, and 2 feet deep.

72. The bridge over the Indrayani river at Indori, described in the report for 1887-88, has been completed, and handed over to the District Local Board; it was opened for traffic in April 1888.

73. The bridge over the Watruk river, on the Baad-Bibipara road, was in progress. It consists of seven main spans, each 57′ 6″, and two end spans of 30 feet each. The piers are of brick, and the roadway is to be carried on Warren girders for the main, and rolled iron beams for the end openings. Up to the end of the year, foundations of the eight central piers had been excavated to the required depth, and the excavation of abutments was in hand, and four of the eight piers were filled in with cement. The estimate amounts to Rs. 1,08,254, and the total outlay to end of the year has been Rs. 60,121.

74. The Chinchni bridge of 5 openings of 20 feet each, in the Thána Collectorate, was completed at a cost of Rs. 8,881.

75. The iron bridge over the Dhadhar river, in the Broach Collectorate, described in last year's report, has made progress. Earthwork in approaches has been completed; the whole of the iron-work has been received from England, and the cylinders of abutments and piers have with some difficulty been conveyed to the site, 25 miles from the railway at Broach. A commencement was made with sinking the cylinders, those of the south abutment being put down nearly to full depth, and the first pier was taken in hand at the close of March. The work is progressing satisfactorily, and it is hoped that the bridge will be ready for traffic before the end of next season. Rs. 81,603 have been expended during the year, and the total expenditure to end of the year has amounted to Rs. 84,786, against the estimate of Rs. 1,50,841.

76. During the last monsoon the old groyne at Phedra, in the Dhandhuka Táluka of the Ahmedabad Collectorate, constructed in 1885, about 72 feet long and 6 feet wide, consisting of double teak piles with planking on both sides and earth filling in the interior, was seriously damaged by the action of floods. Special repairs were carried out by removing the damaged portion, and reconstructing the same on the pattern the new groyne.

77. In Sind the following bridges were completed :—

(1.) Road bridge over the Nurwah Canal, a branch of the Begári. This bridge is intended for the road from Jacobabad to Uch ; it has a single span, 18 feet, and a roadway, 12 feet.

(2.) Road bridge over the Deharwah, on the road from Ubasra to Kumbrah. It consists of one segmental arch, 30 feet span, with abutments 9 feet high, and roadway 15 feet wide.

(3.) Bridge over the Garknowah, of one segmental arch, 25 feet span, with abutments 10 feet high, from the cleared bed to springing.

And the following is in progress :—

(1.) Road bridge over the Sunwah, a branch of the Begári Canal. This bridge is intended for the road from Udi to Dari ; it has a single span of 22 feet, and a roadway of 12 feet.

78. The wood-work of the original wooden bridge over the Fuleli, built in 1856, having become unsound, the piers were replaced by masonry ones, and the girders and platform by iron ones. The former are 27 feet high, measured from the bed of the canal. The height of clear waterway is 9 feet, measured from highest water level to under side of girders, the spans are one of 30 feet, and 2 of 31·6 feet, and the width of roadway is 16 feet. The platform consists of buckled plates supported on 4 longitudinal iron girders. The work also included very heavy pitching to bed and sides of canal, for a distance of 64 feet ; the work was commenced in 1887-88, and was completed during the year under review at a total cost of Rs. 11,322.

79. Numerous other small bridges and culverts over canals, which it is not necessary to particularize, were undertaken, and completed during the year.

5.—BOATS, BRIDGES AND FERRIES.

80. The construction of protective works for the Pargaon ferry, Táluka Bhimthadi, Poona Collectorate, has been undertaken. The revetment wall protecting the standards on the right bank having been undermined by floods, the slope of the river bank was cut back to a slope of 2 to 1, and pitched with headers abutting on concrete footings. The work has made fair progress during the year.

81. The Ghoti ferry in Akola Táluka, Ahmednagar Collectorate, which was practically finished last year, has been completed at a total expenditure of Rs. 4,072.

82. A second pontoon has been added to the ferry boat at Bellapur in the Ahmednagar Collectorate.

83. A moveable jetty on the south bank of the Narbada river, at Broach, commenced and described last year, was completed.

6.—ACCOMMODATION FOR TRAVELLERS.

84. A Travellers' Bungalow at Dhulia is in progress, the existing Travellers' Bungalow on the further side of the river Pánjhra being badly situated for travellers. The accommodation which is sanctioned consists of a double set of dining and bed-rooms, with dressing and bath-rooms, godowns and the necessary out-houses.

85. In Sind additions and alterations were carried out and completed to the staging bungalow at Jacobabad, and a staging bungalow at Dokri has been commenced.

III.—MISCELLANEOUS PUBLIC IMPROVEMENTS.

5.—WATER-SUPPLY.

86. The total outlay under this head was Rs. 2,71,294, divided as under :—

	Rs.
Original works	1,57,338
Repairs	54,700
Establishment	55,854
Tools and Plant	3,402

87. In the Dhárwár Collectorate, at Bhandiwad, improvements to a well estimated to cost Rs. 4,021, were put in hand, and the excavation of the old well shaft has been commenced.

88. Plans and estimates for water-supply projects have been completed for Dhulia and Sásvad in the Khándesh, Gudgeri in the Belgaum, and Dhárwár in the Dhárwár Collectorates, and for the extension of the Kás water supply to the Sátára camp and Sadar Bazár; and are in progress for Yeola in the Násik, and Hubli in the Dhárwár Collectorates, as also for a drainage scheme for the Poona Cantonment.

89. The following works were completed in the Surat Collectorate: —

Improving the tank at Tankaria, at a cost of Rs. 2,994, against the sanctioned estimate of Rs. 4,000, and constructing a weir across the Vanki river near Bulsar, to furnish a supply of water for railway purposes, for which funds were contributed by the B. B. & C. I. Railway Company.

90. Improvements to the Wásad Tank, Kaira Collectorate, were in progress during the year; about two-thirds of the retaining wall on the west side of the village was completed, and the remaining one-third nearly completed.

91. The work of sinking 4 wells, 10 feet diameter each, in the Mota Taláo at Dholera, commenced last year, was completed.

92. A project for water-supply for the city of Ahmedabad, estimated to cost about Rs. 6,00,000, has been prepared and approved by the Municipal Board. The works are to consist of two supply wells each 25 feet in diameter, in the bed of the Sábarmati river, at about 90 feet from the right bank, at Dudeshwar, from which the water will be raised by steam pumps, and delivered into a high level reservoir close by; from this reservoir it will gravitate to the Dehli Gate of the city, by a 27″ main, and from thence the water will be distributed by pipes throughout the city. The supply is calculated at the rate of 10 gallons per head of population, and the distribution service is designed to deliver this quantity in six hours. The average effective head in the pipes in the City will be between 20′ × 30′. The head works were commenced on the 9th March 1889, and are now in progress, but the expenditure during the year was trifling.

6.—SEWAGE, INCLUDING DRAINAGE.

93. A sum of Rs. 3,403 was paid during the year to the Municipality of the city of Bombay, for putting up ventilating shafts in connection with the sewers on the new roads on the Esplanade.

94. The drainage channel round the town of Dholka having considerably silted up, an estimate for its thorough clearance was sanctioned by Government, and Rs. 1,000 was allotted as a grant-in-aid towards the work which has nearly been completed.

7.—HARBOURS.

95. The existing wharf at the Whittle Bandar near Dhollera having been considerably damaged by the erosion of the bank, a project amounting to Rs. 4,441 for a new earth wharf 900′ × 70′, with a branch road 810 feet long and 18 feet wide, to connect it with the existing main road from Dhollera to Whittle Bandar, was sanctioned by Government, from the Northern Group Port Funds, and the work has been carried out.

8.—LIGHT-HOUSES.

96. The new Light-house on the Vengurla Rocks, described in previous years' reports, has been nearly completed. The lantern ordered from England has yet to be put up, and a few other small items remain to be carried out. The total expenditure to the end of the year has amounted to Rs. 14,717, the estimated cost being Rs. 15,939.

MISCELLANEOUS.

97. The work of clearing and levelling ground in the Arkilla, and for the new Bázar, and in the vicinity of public buildings and residences at Bijápur, and of making certain roads, laying out the streets on the site of the new Bazár, planting trees along the sides of almost all the roads in Bijápur, and other items, as originally sanctioned, have been completed by the extra-mural convict gang located at Bijápur, for the purpose. A supplementary programme of works to be undertaken by the convict gang has been sanctioned, and under this scheme the following works were put in hand during the year, and considerable progress was made with them.

Road from the new Bazár to the Railway station.

Branch road from the above to join the Hippargi road at Khavas Khán's Mahál.

Road from the Juma Masjid to the Hippargi road.

The total expenditure to the end of the year amounted to Rs. 1,86,251, against the estimate of Rs. 2,00,295.

98. The construction of a pier at Dábhol, from Excluded Local Funds, was commenced during the year. The pier will be 47′ × 15′, projecting 40 feet from the wharf wall into the creek, so as to have 8 feet depth of water at low tide, at the furthest end.

99. The diversion of the river Khári to protect the village of Bhowáldi has been carried out at a cost of Rs. 5,097. The work has been completely successful.

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